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Environmental Monitoring and Support Lab, Las Vegas, Nev

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NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

REPORT

ON

LAKE HAVASU

MOHAVE COUNTY, ARIZONA

SAN BERNADINO COUNTY, CALIFORNIA

EPA REGION IX

WORKING PAPER No. 728

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT ON LAKE HAVASU

MOHAVE COUNTY, ARIZONA

SAN BERNADINO COUNTY, CALIFORNIA

EPA REGION IX

by

National Eutrophication Survey

Water and Land Quality Branch
Monitoring Operations Division
Environmental Monitoring & Support Laboratory
Las Vegas, Nevada

and

Special Studies Branch
Corvallis Environmental Research Laboratory
Corvallis, Oregon

Working Paper No. 728

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U.S. ENVIRONMENTAL PROTECTION AGENCY

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Arizona State Department of Health for professional involvement, to the Arizona National Guard for conducting the tributary sampling phase of the Survey, and to those Arizona wastewater treatment plant operators who provided effluent samples and flow data.

The staffs of the Bureau of Water Quality Control, Environmental Health Services, Arizona State Department of Health, and the Arizona Game and Fish Department, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper Series.

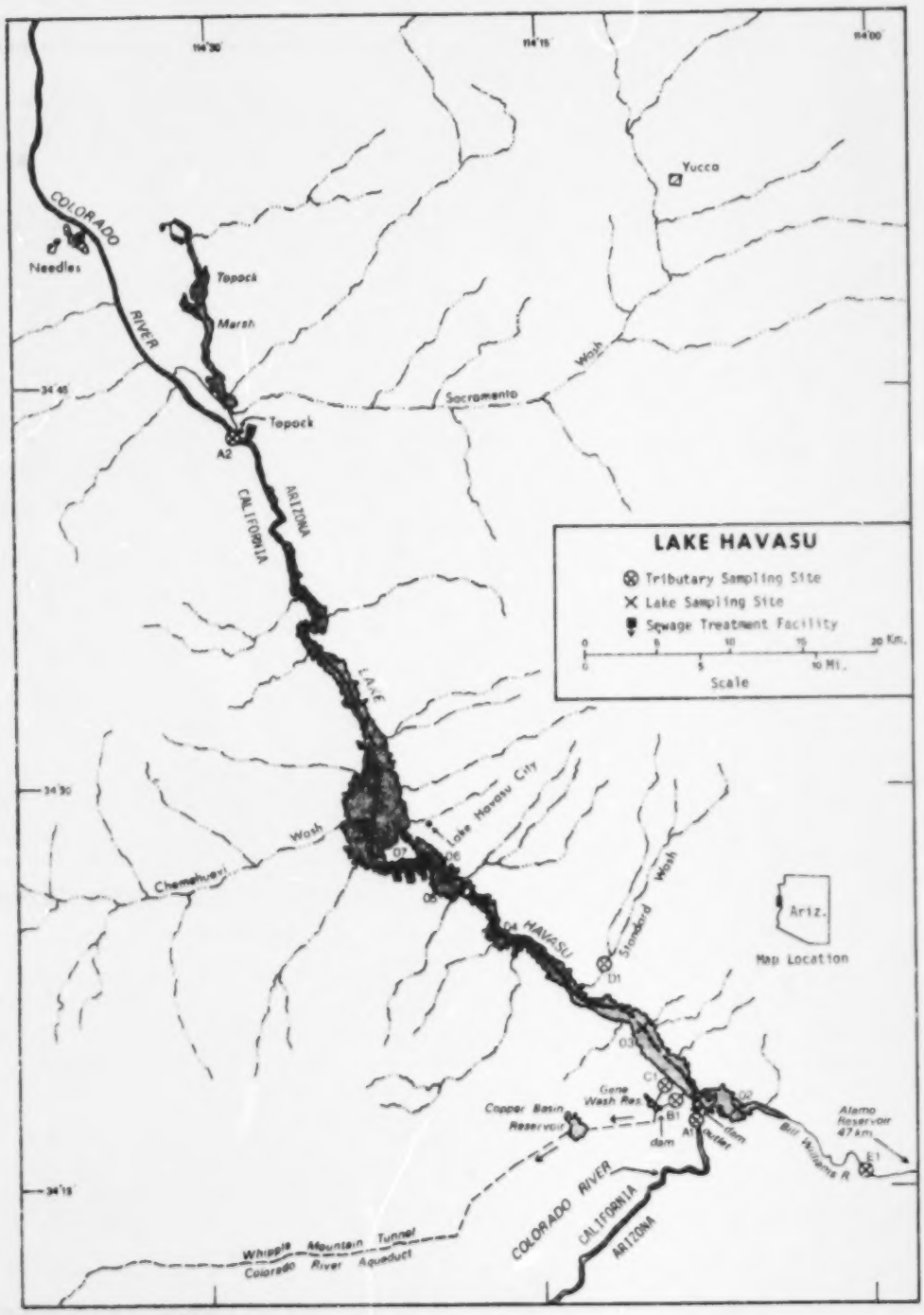
Major General John G. Smith, the Adjutant General of Arizona, and Project Officer Colonel Richard A. Colson, who directed the volunteer efforts of the Arizona National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF ARIZONA

LAKE NAME	COUNTY
Big Lake	Apache
Fools Hollow Lake	Navajo
Lake Havasu	Mohave (San Bernadino in CA)
Luna Lake	Apache
Lyman Lake	Apache
Lake Mohave	Mohave (Clark in NV)
Lake Pleasant	Yavapai, Maricopa
Lake Powell	Coconino (Kane, Garfield, San Juan in UT)
Rainbow Lake	Navajo
Theodore Roosevelt Lake	Gila
San Carlos Reservoir	Graham, Gila, Pinal


LAKE HAVASU
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Scale
Map Location
Ariz.
Yucca
Needles
COLORADO RIVER
Topock Marsh
Topock
A2
Sacramento Wash
CALIFORNIA
ARIZONA
LAKE
Lake Havasu City
Chemehuevi Wash
Standard Wash
CA HAVASU
Copper Basin Reservoir
Gene Wash Res
dam
Alamo Reservoir 47 s.m.
Bill Williams R
COLORADO RIVER
CALIFORNIA
ARIZONA
Whipple Mountain Tunnel
Colorado River Aqueduct
114°30
114°15
114°00
34°45
34°30
34°15

REPORT ON LAKE HAVASU, ARIZONA

STORET NO. 0403

I. CONCLUSIONS

A. Trophic Condition:*

Survey data indicate that Lake Havasu is mesotrophic. Chlorophyll a values in the lake ranged from 1.0 µg/l in February to 8.2 µg/l in June, with a mean of 3.9 µg/l. Potential for primary production as measured by algal assay control yields was low. Lake water transparency was generally good during June sampling but low on the February and November sampling occasions. Of the 11 Arizona lakes sampled in 1975, 9 had higher median total phosphorus values (0.015 mg/l), 2 had higher median inorganic nitrogen levels (0.170 mg/l), and 9 had higher median orthophosphorus values (0.005 mg/l) than Lake Havasu.

Survey limnologists did not report any problem algal blooms or macrophyte growths during their visits to the lake. Other sources (The Division of International Engineering Co., Inc. and Metcalf & Eddy Inc., 1976; Utah State University, 1975) indicate that salinity is the major water quality factor in the Colorado River basin, rather than nutrient-related problems.

*See Appendix E.

B. Rate-Limiting Nutrient:

The algal assay results indicate that Lake Havasu was limited by available phosphorus levels. The lake data further suggest primary limitation by phosphorus in Lake Havasu throughout the sampling year.

C. Nutrient Controllability:

1. Point sources -

During the sampling year, the measured point sources directly impacting Lake Havasu were calculated to contribute 2.7% of the total phosphorus load. The wastewater treatment plant at Needles contributed 2.5% and plants at Catfish Trailer Park and Cattail Cove State Park each contributed 0.1%. The Division of International Engineering Co., Inc. and Metcalf & Eddy Inc. (1976) report that the community of Lake Havasu also has several municipal treatment facilities which divert their discharge waters into local irrigational use; how much, if any, of these discharges eventually reach Lake Havasu is not known at this time.

The present phosphorus loading of 3.64 g $P/m^2/yr$ is almost twice that proposed by Vollenweider (1975) as "eutrophic" for a lake with such volume and hydraulic retention time. The combination of a mesotrophic condition and high phosphorus loading is possible because Vollenweider's model probably is

not applicable to lakes in which epilimnetic light penetration is substantially reduced by the presence of suspended sediments in the surface waters, as in Lake Havasu during spring and fall. In any case, the future addition of point source contributions should be carefully evaluated as to their effect on the existing water quality of Lake Havasu.

2. Nonpoint sources -

Nonpoint sources, including precipitation, contributed 97.3% of the total phosphorus input during the year to Lake Havasu. The Colorado River contributed 96.6% and ungaged tributaries contributed an estimated 0.2%.

The phosphorus export rates of the tributaries flowing into Lake Havasu (Section IV-D) are equal to the Colorado River export of upstream Lake Mohave*.

*See Working Paper No. 731.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Lake morphometry data were provided by Ned Rathbun (1974); average surface area and average volume are indicated. Tributary flow data were provided by the Arizona District Office of the U.S. Geological Survey (USGS). Outlet drainage area includes the lake surface area. Mean hydraulic retention time was obtained by dividing the lake volume by mean flow of the outlet. Precipitation values are estimated by methods as outlined in National Eutrophication Survey (NES) Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

a. Lake Morphometry:

1. Surface area: 77.30 km^2.
2. Mean depth: 9.2 meters.
3. Maximum depth: 137.2 meters.
4. Volume: 713.080 x 10^6 m^3.
5. Mean hydraulic retention time: 32 days.

B. Tributary and Outlet:
(See Appendix B for flow data)

1. Tributaries -

Name	Drainage area (km^2)	Mean flow (m^3/sec)
A-2 Colorado River	446,256.8	305.29
B-1 Gene Wash	17.6	0.01
Minor tributaries and immediate drainage -	16,757.7	0.72
Total	463,032.1	306.02
2. Outlet - A-1 Colorado River	463,091.8	260.69

C. Precipitation:

1. Year of sampling: 7.4 cm.
2. Mean annual: 9.7 cm.

III. LAKE WATER QUALITY SUMMARY

Lake Havasu was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from eleven stations on the lake and from one or more depths at each station (see map, page v). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first and last visits, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths sampled were as follows:

Station Number	Maximum Depth (meters)
01	17.4
02	8.5
03	17.1
04	18.6
05	13.1
06	10.1
07	10.7
08	10.4
09	7.3
10	7.0
11	1.5

For a more detailed explantion of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

A. PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(2/27/75) sooo = 11 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(6/13/75) sooo = 11 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(11/19/75) sooo = 11 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	21	8.0- 13.0	9.5	0.0- 1.5	19	17.9- 25.9	24.0	0.0- 1.5	22	12.2- 14.8	13.2	0.0- 1.5
MAX DEPTHOO	11	7.3- 10.3	8.3	1.5- 18.3	11	17.7- 22.1	18.6	0.0- 17.4	11	11.9- 14.8	13.1	1.5- 18.6
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	21	10.5- 11.8	11.2	0.0- 1.5	19	6.0- 8.8	8.0	0.0- 1.5	22	9.0- 10.2	9.6	0.0- 1.5
MAX DEPTHOO	11	9.0- 11.4	10.2	1.5- 18.3	11	6.2- 8.2	7.2	0.0- 17.4	11	8.8- 10.0	9.4	1.5- 18.6
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	21	709.-1212.	1086.	0.0- 1.5	19	982.-1383.	1332.	0.0- 1.5	22	757.- 837.	794.	0.0- 1.5
MAX DEPTHOO	11	745.-1125.	1076.	1.5- 18.3	11	982.-1288.	1177.	0.0- 17.4	11	765.- 837.	799.	1.5- 18.6
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	21	8.4- 8.5	8.5	0.0- 1.5	19	8.2- 8.4	8.4	0.0- 1.5	22	8.0- 8.3	8.3	0.0- 1.5
MAX DEPTHOO	11	8.4- 8.6	8.5	1.5- 18.3	11	7.8- 8.5	8.2	0.0- 17.4	11	8.1- 8.3	8.3	1.5- 18.6
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	21	135.- 138.	137.	0.0- 1.5	19	134.- 142.	137.	0.0- 1.5	22	123.- 142.	133.	0.0- 1.5
MAX DEPTHOO	11	131.- 139.	137.	1.5- 18.3	11	134.- 142.	137.	0.0- 17.4	11	126.- 144.	133.	1.5- 18.6
TOTAL P (MG/L)												
0.-1.5 M DEPTH	21	0.013-0.027	0.017	0.0- 1.5	19	0.009-0.030	0.011	0.0- 1.5	22	0.013-0.034	0.017	0.0- 1.5
MAX DEPTHOO	10	0.012-0.041	0.014	1.5- 18.3	11	0.010-0.027	0.017	0.0- 17.4	11	0.012-0.043	0.016	1.5- 18.6
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	21	0.003-0.021	0.003	0.0- 1.5	19	0.004-0.030	0.011	0.0- 1.5	22	0.002-0.013	0.003	0.0- 1.5
MAX DEPTHOO	10	0.003-0.020	0.005	1.5- 18.3	11	0.004-0.030	0.013	0.0- 17.4	11	0.002-0.010	0.002	1.5- 18.6
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	21	0.040-0.220	0.150	0.0- 1.5	19	0.110-0.220	0.140	0.0- 1.5	22	0.100-0.170	0.140	0.0- 1.5
MAX DEPTHOO	10	0.120-0.220	0.165	1.5- 18.3	11	0.120-0.220	0.140	0.0- 17.4	11	0.100-0.420	0.130	1.5- 18.6
AMMONIA (MG/L)												
0.-1.5 M DEPTH	21	0.020-0.060	0.020	0.0- 1.5	19	0.040-0.100	0.050	0.0- 1.5	22	0.020-0.030	0.020	0.0- 1.5
MAX DEPTHOO	10	0.020-0.030	0.020	1.5- 18.3	11	0.040-0.160	0.080	0.0- 17.4	11	0.020-0.030	0.020	1.5- 18.6
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	21	0.600-0.900	0.600	0.0- 1.5	19	0.300-1.200	0.600	0.0- 1.5	22	0.200-0.300	0.200	0.0- 1.5
MAX DEPTHOO	10	0.300-0.600	0.500	1.5- 18.3	11	0.300-0.700	0.600	0.0- 17.4	11	0.200-0.600	0.200	1.5- 18.6
SECCHI DISC (METERS)	10	0.4- 2.2	1.5		5	1.2- 5.1	4.2		11	0.6- 2.4	1.5	

N* = NO. OF SAMPLES
** = MAXIMUM DEPTH SAMPLED AT EACH SITE
sooo = NO. OF SITES SAMPLED ON THIS DATE

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B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units Per ml
02/27/75	1. Oscillatoria	495
	2. Chroomonas	180
	3. Cryptomonas	90
	4. Synedra	90
	5. Cyclotella	90
	Other genera	45
	Total	990
06/13/75	1. Fragilaria	514
	2. Cyclotella	206
	3. Trachelomonas	128
	4. Cryptomonas	103
	5. Oocystis	77
	Other genera	128
	Total	1,156
11/19/75	1. Raphidiopsis	624
	2. Cryptomonas	381
	3. Cyclotella	173
	4. Chroomonas?	139
	5. Lyngbya	139
	Other genera	276
	Total	1,732

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
02/27/75	01	7.2
	02	5.1
	03	8.2
	04	4.6
	05	4.8
	06	4.8
	07	6.1
	08	6.3
	09	5.4
	10	6.4
	11	6.4
06/13/75	01	1.0
	02	8.0
	03	1.1
	04	1.1
	05	1.6
	06	1.1
	07	1.5
	08	1.4
	09	---
	10	---
	11	---
11/19,20/75	01	3.4
	02	6.0
	03	3.6
	04	2.4
	05	4.1
	06	2.6
	07	3.3
	08	4.0
	09	2.1
	10	1.7
	11	3.1

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. 02/27/75 Stations 01,02

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum Yield (mg/l-dry wt.)
Control	<0.005	0.152	0.3
0.05 P	<0.055	0.152	5.2
0.05 P + 1.0 N	<0.055	1.152	24.1
1.00 N	<0.005	1.152	0.3
	Stations 03,04		
Control	<0.005	0.152	0.2
0.05 P	<0.055	0.152	1.8
0.05 P + 1.0 N	<0.055	1.152	31.5
1.00 N	<0.005	1.152	0.2

b. 11/19/75 Stations 01-04

Control	0.005	0.260	0.2
0.05 P	0.055	0.260	7.8
0.05 P + 1.0 N	0.055	1.260	9.4
1.00 N	0.005	1.260	0.2
	Stations 06-09		
Control	0.005	0.200	0.1
0.05 P	0.055	0.140	6.5
0.05 P + 1.0 N	0.055	1.140	18.6
1.00 N	0.005	1.200	0.1

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum*, indicate that the potential for primary productivity in Lake Havasu was low at both sample collection times (02/27/75, 11/19/75). The addition of phosphorus alone produced an increase in yield over that of the control at Stations 01-04 in February and at Stations 01-09 in November, indicating phosphorus limitation. Spikes of nitrogen alone did not stimulate growth beyond the control yields in these assays.

The February assays for Station 07-11 are not considered reliable because of a significant change in the nutrient levels between the time the samples were collected and the assays were begun, so are not included in this report.

The inorganic nitrogen to orthophosphorus ratios (N/P) in the lake were approximately 20/1, 17/1, and 41/1 in the spring, summer, and fall, respectively, suggesting primary limitation by phosphorus (a mean N/P ratio of 14/1 or greater generally reflects phosphorus limitation).

*For further information regarding the algal assay test procedure and selection of test organisms, see U.S. EPA (1971).

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Arizona National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of April and May when two samples were collected. Sampling was begun in December 1974, and was completed in November 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Arizona District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean annual concentrations in Gene Wash, the Colorado River Aqueduct and Bill Williams River at Stations B-1, C-1 and E-1 and mean annual ZZ flow.

The operators of the Catfish Trailer Park and Needles wastewater treatment plants provided a number of effluent samples and corresponding flow data. Nutrient loads for Cattail Cove State Park were calculated from provided monthly chemistry data and estimated flows.

A. Waste Sources:

1. Known municipal -

Name	Pop.* Served	Treatment*	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
Catfish Trailer Park	200	Activated Sludge	0.049	Colorado River
Needles	6,000	Trickling Filter	3.200	Colorado River
Cattail Cove State Park	300	Activated Sludge	0.113**	Lake Havasu

2. Known industrial - None

*Provided by treatment plant operator.
**Esimated at 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source		kg P/yr	% of total
a.	Tributaries (nonpoint load) -		
	A-2 Colorado River	272,190	96.6
	B-1 Gene Wash	5	<0.1
b.	Minor tributaries and immediate drainage (nonpoint load) -	660	0.2
c.	Known municipal STP's -		
	Catfish Trailer Park	180	0.1
	Needles	7,060	2.5
	Cattail Cove State Park	250	0.1
d.	Septic tanks* -	25	<0.1
e.	Known industrial - None		
f.	Direct precipitation** -	1,350	0.5
	Total	281,720	100.0%

2. Outputs - A-1 Colorado River 190,275

3. Net annual P accumulation - 91,445

*Estimate based on 72 lakeshore residences, 3 campgrounds, and 1 park.
**Estimated (See NES Working Paper No. 175).

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source		kg N/yr	% of total
a.	Tributaries (nonpoint load) -		
	A-2 Colorado River	7,949,325	98.5
	B-1 Gene Wash	220	<0.1
b.	Minor tributaries and immediate drainage (nonpoint load) -	21,025	0.3
c.	own municipal STP's -		
	Catfish Trailer Park	590	<0.1
	Needles	16,845	0.2
	Cattail Cove State Park	1,625	<0.1
d.	Septic tanks* -	1,015	<0.1
e.	Known industrial - None		
f.	Direct precipitation** -	83,455	1.0
	Total	8,074,100	100.0%

2. Outputs - A-1 Colorado River 7,826,805

3. Net annual N accumulation - 247,295

*Estimate based on 72 lakeshore residences, 3 campgrounds and 1 park.
**Estimated (See NES Working Paper No. 175).

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Colorado River	1	18
Gene Wash	<1	12

E. Mean Nutrient Concentrations in Ungaged Streams:

Tributary	Mean Total P (mg/l)	Mean Total N (mg/l)
C-1 Colorado River Aqueduct	0.036	0.862
E-1 Bill Williams River	0.026	1.275

F. Yearly Loadings:

In the following table, the existing phosphorus loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving waters would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between "eutrophic" and "oligotrophic".

Note that Vollenweider's model may not be applicable to water bodies with very short retention times or in which light penetration is severely restricted from high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)
Estimated loading for Lake Havasu	3.64
Vollenweider's "eutrophic" loading	1.94
Vollenweider's "oligotrophic" loading	0.97

V. LITERATURE REVIEWED

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VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR ARIZONA 11/26/76

LAKE CODE 0403 LAKE HAVASU

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 463091.0

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
0403A1	463091.0	141.58	226.53	311.49	339.80	311.49	339.80	396.44	339.80	269.01	184.06	130.26	135.92	260.69
0403A2	446256.0	178.40	263.35	353.96	396.44	373.78	396.44	424.73	382.28	311.49	232.20	178.40	169.90	305.29
040381	17.0	0.011	0.011	0.008	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
040377	16835.0	0.425	1.416	2.832	0.850	0.283	0.142	0.085	0.425	0.425	0.566	0.708	0.566	0.723

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 463091.0
SUM OF SUB-DRAINAGE AREAS = 463109.3

TOTAL FLOW IN = 3670.22
TOTAL FLOW OUT = 3126.18

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0403A1	12	74	149.541	7	79.287	7	59.465		
	1	75	166.456						
	2	75	228.092	15	233.331	15	265.046		
	3	75	317.715	15	250.038	15	393.604		
	4	75	378.596	12	255.418	12	393.604		
	4	75	378.596	25	453.069	25	535.188		
	5	75	354.527	10	382.277	10	509.703		
	5	75	354.527	24	342.634	24	515.366		
	6	75	330.174	14	325.644	14	521.030		
	7	75	380.012	5	396.436	5	521.030		
	8	75	369.535	23	348.297	23	518.198		
	9	75	309.503	13	311.485	13	523.862		
	10	75	219.456	18	245.746	18	373.782		
	11	75	160.273	15	186.042	15	256.834		
0403A2	12	74	172.648	7	108.176	7	124.594		
	1	75	194.147						
	2	75	257.995	15	281.186	15	314.317		
	3	75	341.218	15	291.663	15	322.612		
	4	75	423.620	11	140.452	11	131.956		
	4	75	423.620	26	501.208	26	515.366		
	5	75	392.188	10	308.654	10	281.752		
	5	75	392.188	24	393.504	24	436.079		
	6	75	359.341	14	359.624	14	407.762		
	7	75	406.347	5	407.762	5	438.911		
	8	75	386.525	23	351.129	23	390.772		
	9	75	320.547	13	288.832	13	328.475		
	10	75	241.373	18	233.048	18	261.051		
	11	75	178.396	15	164.238	15	177.263		

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TRIBUTARY FLOW INFORMATION FOR ARIZONA 11/26/76

LAKE CODE 0403 LAKE HAVASU

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
040381	12	74	0.014	7	0.014	23	0.014		
	1	75	0.011	0	0.0				
	2	75	0.011	15	0.011	10	0.012		
	3	75	0.008	15	0.008	14	0.009		
	4	75	0.011	12	0.014	14	0.014		
	5	75	0.011	10	0.011	14	0.011	25	0.011
	6	75	0.011	14	0.011	16	0.010	24	0.011
	7	75	0.011	5	0.011	16	0.011		
	8	75	0.011	23	0.011	18	0.011		
	9	75	0.011	13	0.011	12	0.013		
	10	75	0.011	18	0.011	15	0.012		
	11	75	0.011	15	0.011	14	0.011		
	12	75	0.011	0	0.0				
040377	12	74	0.057						
	1	75	0.057						
	2	75	0.057						
	3	75	0.142						
	4	75	0.227						
	5	75	0.057						
	6	75	0.113						
	7	75	0.057						
	8	75	0.057						
	9	75	0.028						
	10	75	0.028						
	11	75	0.028						

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/11/26
NAIL EUTHOPHICATION SURVEY
EPA-LAS VEGAS

040301
34 18 01.0 114 08 15.0 3
LAKE HAVASU
04027 ARIZONA

11014

11EPALES 2111202
0061 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	10 30	0000	9.2	11.4	72	1101	8.65	136	0.020K	0.500	0.040	0.004
	10 30	0005	9.1	11.2		1086	8.65	135	0.020	0.400	0.040	0.006
	10 30	0016	9.1	11.4		1100	8.65	137	0.020K	0.500	0.040	0.004
	10 30	0031	8.4	11.6		1102	8.60	137	0.020K	0.400	0.110	0.003
	10 30	0044	8.2	10.6		1133	8.50	136	0.020K	0.400	0.120	0.003
	10 30	0057	8.0	10.2		1125	8.45	135	0.020	0.400	0.130	0.003
75/06/13	10 15	0000	24.0	6.0	120	1360	8.40	142	0.040	1.200	0.130	0.011
	10 15	0005	23.8	8.2		1350	8.35	141	0.040	0.500	0.130	0.013
	10 15	0015	22.9	8.0		1308	8.25	140	0.040	0.400	0.140	0.013
	10 15	0030	21.4	6.6		1262	7.90	135	0.060	0.400	0.160	0.009
	10 15	0057	17.7	4.2		1177	7.80	141	0.150	0.600	0.180	0.010
75/11/19	09 50	0000	14.6	9.2	48	805	8.30	142	0.020K	0.200K	0.110	0.004
	09 50	0005	14.6	9.6		820	8.30	138	0.030	0.200K	0.120	0.005
	09 50	0020	14.6	9.0		827	8.20	141	0.030	0.200K	0.120	0.005
	09 50	0035	14.6	9.0		834	8.20	134	0.030	0.200K	0.120	0.003
	09 50	0053	14.6	9.2		806	8.30	135	0.030	0.200K	0.120	0.002

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/02/27	10 30	0000	0.016	7.2	
	10 30	0005	0.015		
	10 30	0016	0.017		
	10 30	0031	0.015		
	10 30	0044	0.014		
	10 30	0057	0.016		
75/06/13	10 15	0000	0.030	1.0	
	10 15	0005	0.012		
	10 15	0015	0.011		
	10 15	0030	0.012		
	10 15	0057	0.027		
75/11/19	09 50	0000	0.034	3.4	
	09 50	0005	0.016		
	09 50	0020	0.018		
	09 50	0035	0.014		
	09 50	0053	0.012		

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/11/20
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040302
34 17 54.0 114 05 54.0 3
LAKE HAVASU
04027 ARIZONA

110191

11EPALES 2111202
0020 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	09 45	0000	9.4	11.0	34	1128	8.60	138	0.040	0.800	0.120	0.009
	09 45	0006	8.7	10.2		1134	8.45	140	0.020	0.400	0.120	0.005
	09 45	0011	8.7	10.2		1113	8.45	143	0.020	0.400	0.120	0.005
	09 45	0016	8.6	10.2		1101	8.45	138	0.020K	0.300	0.120	0.004
75/06/13	10 30	0000	25.1	8.0	48	1383	8.45	140	0.040	0.600	0.110	0.011
	10 30	0005	24.5	8.2		1366	8.45	140	0.040	0.400	0.120	0.008
	10 30	0015	22.7	7.8		1306	8.30	137	0.020	0.400	0.140	0.007
	10 30	0026	22.1	8.0		1288	8.50	142	0.040	0.600	0.120	0.014
75/11/19	09 20	0000	14.8	9.0	24	836	8.00	133	0.020K	0.200K	0.110	0.006
	09 20	0005	14.8	9.6		837	8.25	133	0.020K	0.200K	0.100	0.004
	09 20	0015	14.8	9.0		850	8.25	138	0.020	0.200K	0.110	0.004
	09 20	0026	14.8	8.8		837	8.10	138	0.020	0.200K	0.100	0.010

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	09 45	0000	0.021	5.1	
	09 45	0006	0.017		
	09 45	0011	0.016		
	09 45	0016	0.015		
75/06/13	10 30	0000	0.015	8.0	
	10 30	0005	0.010		
	10 30	0015	0.013		
	10 30	0026	0.017		
75/11/19	09 20	0000	0.023	6.0	
	09 20	0005	0.020		
	09 20	0015	0.020		
	09 20	0026	0.035		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040303
34 21 00.0 114 10 40.0 3
LAKE HAVASU
04015 ARIZONA

110141

11FEALES 2111202
0060 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/21	11	20 0000						135	0.020K	0.700	0.100	0.004
	11	20 0005						135	0.020K	0.500	0.100	0.004
	11	20 0016						135	0.020K	0.400	0.100	0.004
	11	20 0029						135	0.020	0.400	0.110	0.014
	11	20 0043						136	0.020K	0.500	0.110	0.004
	11	20 0056						136	0.020	0.400	0.120	0.003
75/02/27	11	20 0000	9.4	11.2	12	1106	8.65					
	11	20 0005	9.0	11.2		1108	8.65					
	11	20 0016	8.2	11.0		1124	8.65					
	11	20 0029	8.2	11.0		1116	8.60					
	11	20 0043	8.1	10.6		1196	8.55					
	11	20 0056	8.0	10.4		1108	8.50					
75/06/13	10	50 0000	24.0	8.8		1335	8.40	137	0.060	0.700	0.150	0.008
	10	50 0005	23.9	8.0		1131	8.40	138	0.050	0.500	0.140	0.007
	10	50 0015	23.4	8.0		1315	8.40	138	0.050	0.500	0.140	0.009
	10	50 0035	21.3	5.0		1454	7.85	137	0.060	0.600	0.150	0.007
	10	50 0055	18.0	4.6		1177	7.80	141	0.160	0.600	0.170	0.011
75/11/19	10	30 0000	14.5	9.2	60	808	8.30	132	0.030	0.200K	0.130	0.003
	10	30 0005	14.5	9.2		807	8.30	136	0.020	0.200K	0.130	0.003
	10	30 0015	14.4	9.0		827	8.30	133	0.030	0.200K	0.120	0.003
	10	30 0025	14.5	9.2		841	8.30	133	0.030	0.200K	0.130	0.004
	10	30 0052	14.5	8.8		813	8.30	132	0.030	0.200K	0.120	0.005

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/21	11	20 0000	0.022		
	11	20 0005	0.015		
	11	20 0016	0.014		
	11	20 0029	0.021		
	11	20 0043	0.014		
	11	20 0056	0.021		
75/02/27	11	20 0000		8.2	
75/06/13	10	50 0000	0.011	1.1	
	10	50 0005	0.009		
	10	50 0015	0.009		
	10	50 0035	0.017		
	10	50 0055	0.010		
75/11/19	10	30 0000	0.016	3.6	
	10	30 0005	0.015		
	10	30 0015	0.018		
	10	30 0025	0.018		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 75/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040304
34 24 08.0 114 16 20.0 3
LAKE HAVASU
04015 ARIZONA

110191

11EPALES 2111206
0064 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	14	15 0000	10.5	11.2		1087	8.60	138	0.020	0.500	0.140	0.003
	14	15 0005	9.6	11.2		1108	8.60	137	0.020K	0.600	0.140	0.004
	14	15 0015	8.1	11.4		1102	8.60	137	0.020K	0.600	0.140	0.005
	14	15 0030	7.9	11.0		1081	8.60	138	0.020K	0.400	0.140	0.004
	14	15 0045	7.8	11.0		1104	8.60	137	0.020K	0.500	0.160	0.004
	14	15 0060	7.8	11.2		1086	8.60	137	0.020K	0.500	0.160	0.004
75/06/13	11	10 0000	24.1	8.0	164	1337	8.40	137	0.050	0.400	0.140	0.009
	11	10 0005	23.6	8.0		1319	8.40	137	0.040	0.500	0.140	0.010
	11	10 0015	22.9	8.0		1293	8.40	137	0.040	0.600	0.140	0.010
	11	10 0035	19.4	6.6		1198	7.95	135	0.080	0.200	0.170	0.010
	11	10 0053	18.5	6.4		1186	8.25	139	0.080	0.400	0.160	0.008
75/11/19	11	00 0000	13.9	10.0	72	793	8.30	130	0.020	0.200K	0.120	0.005
	11	00 0005	14.0	9.4		825	8.30	133	0.030	0.200	0.130	0.003
	11	00 0015	14.0	9.4		820	8.30	134	0.020	0.200K	0.130	0.003
	11	00 0027	13.9	9.4		819	8.20	134	0.020	0.200K	0.130	0.002
	11	00 0045	13.9	9.8		805	8.30	138	0.020	0.200K	0.130	0.004
	11	00 0061	13.9	9.4		826	8.30	134	0.020K	0.200K	0.130	0.002

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	14	15 0000	0.024	4.6	
	14	15 0005	0.020		
	14	15 0015	0.014		
	14	15 0030	0.013		
	14	15 0045	0.013		
	14	15 0060	0.014		
75/06/13	11	10 0000	0.009	1.1	
	11	10 0005	0.014		
	11	10 0015	0.011		
	11	10 0035	0.010		
	11	10 0053	0.012		
75/11/19	11	00 0000	0.018	2.4	
	11	00 0005	0.018		
	11	00 0015	0.013		
	11	00 0027	0.013		
	11	00 0045	0.014		
	11	00 0061	0.013		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040305
34 26 27.0 114 19 44.0 3
LAKE HAVASU
04015 ARIZONA

110191

11EPALES 2111202
0037 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	14	55 0000	9.4	11.4	84	1106	8.60	137	0.020K	0.600	0.140	0.006
	14	55 0005	9.1	11.6		1111	8.60	137	0.020K	0.500	0.150	0.004
	14	55 0016	8.0	11.6		1102	8.60	138	0.020	0.500	0.140	0.012
	14	55 0023	7.6	11.6		1086	8.60	138	0.020	0.600	0.150	0.013
	14	55 0033	7.5	11.0		1090	8.50	138	0.020K	0.500	0.160	0.012
75/06/13	13	10 0000	25.2	6.8	240	1379	8.40	136	0.060	0.400	0.140	0.009
	13	10 0005	24.0	8.2		1332	8.40	137	0.040	0.400	0.140	0.007
	13	10 0015	22.4	8.0		1261	8.40	136	0.040	0.400	0.140	0.005
	13	10 0030	19.2	6.4		1208	8.20	137	0.050	0.400	0.200	0.007
	13	10 0043	18.2	4.2		1195	7.90	140	0.130	0.500	0.180	0.009
75/11/20	10	20 0000	13.3	9.6	72	792	8.30	138	0.020K	0.200K	0.130	0.002K
	10	20 0005	13.2	9.4		791	8.30	136	0.020	0.300	0.140	0.004
	10	20 0015	13.2	9.2		800	8.30	134	0.020K	0.200K	0.140	0.002K
	10	20 0027	13.2	9.2		811	8.30	135	0.020K	0.200	0.130	0.002K
	10	20 0035	13.1	9.4		806	8.30	133	0.020	0.200	0.130	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	14	55 0000	0.016	4.8	
	14	55 0005	0.018		
	14	55 0016	0.013		
	14	55 0023	0.023		
	14	55 0033	0.013		
75/06/13	13	10 0000	0.011	1.6	
	13	10 0005	0.009		
	13	10 0015	0.009		
	13	10 0030	0.010		
	13	10 0043	0.014		
75/11/20	10	20 0000	0.018	4.1	
	10	20 0005	0.015		
	10	20 0015	0.016		
	10	20 0027	0.013		
	10	20 0035	0.013		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040306
34 27 29.0 114 20 32.0 3
LAKE HAVASU
04015 ARIZONA

110141

11EPALES 2111206
0037 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 OO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	15 30	0000	9.2	11.4	72	1192	8.60	137	0.020K	0.600	0.140	0.004
	15 30	0005	8.0	11.8		1212	8.65	137	0.020K	0.500	0.140	0.003
	15 30	0016	8.0	11.6		1428	8.60	138	0.020K	0.600	0.160	0.002
	15 30	0023	7.6	11.2		1166	8.60	134	0.020K	0.500	0.160	0.002
	15 30	0033	7.3	11.0		1076	8.50	139	0.020K	0.500	0.170	0.003
75/06/13	13 30	0000	25.9	8.4	150	1380	8.40	135	0.070	0.600	0.140	0.006
	13 30	0005	25.1	8.0		1351	8.35	136	0.050	0.400	0.140	0.004
	13 30	0015	22.7	8.4		1289	8.40	136	0.050	0.400	0.140	0.010
	13 30	0022	20.6	7.4		1233	8.20	137	0.080	0.400	0.170	0.004
75/11/19	11 30	0000	13.4	9.2	54	820	8.30	133	0.020	0.200K	0.140	0.004
	11 30	0005	13.5	9.6		791	8.25	131	0.020	0.200K	0.140	0.003
	11 30	0024	13.4	9.2		816	8.20	131	0.020	0.200K	0.140	0.004
	11 30	0031	13.4	9.6		799	8.25	133	0.020	0.200K	0.140	0.004

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	15 30	0000	0.013	4.8	
	15 30	0005	0.013		
	15 30	0016	0.017		
	15 30	0023	0.014		
	15 30	0033	0.012		
75/06/13	13 30	0000	0.010	1.1	
	13 30	0005	0.011		
	13 30	0015	0.009		
	13 30	0022	0.020		
75/11/19	11 30	0000	0.014	2.6	
	11 30	0005	0.013		
	11 30	0024	0.013		
	11 30	0031	0.043		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040307
34 26 42.0 114 21 50.0 3
LAKE HAVASU
04015 ARIZONA

110191

11EPALES 2111202
0039 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	14	55 0000	13.0	11.2	86	840	8.50	138	0.020	0.700	0.170	0.004
	14	55 0005	11.6	11.8		795	8.55	136	0.020K	0.500	0.150	0.004
	14	55 0015	9.5	11.8		790	8.50	136	0.020K	0.400	0.140	0.012
	14	55 0025	9.5	11.8		790	8.55	137	0.020K	0.500	0.150	0.009
	14	55 0035	9.5	11.4		790	8.55	137	0.020K	0.600	0.150	0.005
75/06/13	13	10 0000	25.4	8.0		1143	8.40	137	0.080	1.000	0.150	0.023
	13	10 0005	24.3	8.6		1120	8.45	135	0.040	0.300	0.140	0.016
	13	10 0015	22.9	8.5		1012	8.35	136	0.040	0.300	0.150	0.011
	13	10 0030	20.0	7.8		1015	8.20	137	0.060	0.300	0.210	0.013
75/11/19	13	00 0000	13.1	9.8	42	796	8.30	128	0.020	0.200K	0.140	0.007
	13	00 0005	13.1	9.6		802	8.10	130	0.020	0.200	0.140	0.013
	13	00 0027	13.1	9.6		797	8.20	130	0.020	0.200	0.130	0.008
	13	00 0031	13.1	9.6		797	8.25	133	0.020	0.200	0.130	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	14	55 0000	0.015	6.1	
	14	55 0005	0.017		
	14	55 0015	0.021		
	14	55 0025	0.015		
	14	55 0035	0.014		
75/06/13	13	10 0000	0.028	1.5	
	13	10 0005	0.011		
	13	10 0015	0.014		
	13	10 0030	0.014		
75/11/19	13	00 0000	0.016	3.3	
	13	00 0005	0.015		
	13	00 0027	0.016		
	13	00 0031	0.016		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 75/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040308
34 28 14.0 114 22 30.0 3
LAKE HAVASU
04015 ARIZONA

110191

11EPALES 2111202
0026 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	13 00	0000	10.2	11.6	78	705	8.55	136	0.030	0.700	0.170	0.015
	13 00	0005	9.3	11.8		780	8.60	137	0.020K	0.600	0.160	0.016
	13 00	0015	9.0	10.8		775	8.50	138	0.020	0.500	0.170	0.014
	13 00	0024	8.3	10.4		765	8.40	138	0.030	0.500	0.190	0.005
75/06/13	11 00	0000	24.0	8.0		1121	8.40	135	0.060	0.600	0.160	0.019K
	11 00	0005	23.7	8.4		1108	8.40	135	0.040	0.300	0.150	0.016K
	11 00	0015	23.0	8.0		1092	8.40	137	0.040	0.300	0.160	0.028K
	11 00	0034	19.0	6.8		995	8.00	137	0.080	0.300	0.210	0.021K
75/11/20	10 00	0000	12.7	9.4	60	764	8.30	129	0.020K	0.200	0.140	0.002K
	10 00	0005	12.6	9.4		788	8.30	131	0.020K	0.200K	0.140	0.002K
	10 00	0015	12.6	9.4		777	8.30	135	0.020K	0.200K	0.150	0.002K
	10 00	0024	12.5	9.2		774	8.30	138	0.020K	0.200K	0.140	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	13 00	0000	0.015	6.3	
	13 00	0005	0.027		
	13 00	0015	0.015		
	13 00	0024	0.013		
75/06/13	11 00	0000	0.014	1.4	
	11 00	0005	0.010		
	11 00	0015	0.013		
	11 00	0034	0.017		
75/11/20	10 00	0000	0.017	4.0	
	10 00	0005	0.017		
	10 00	0015	0.014		
	10 00	0024	0.017		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040309
34 31 36.0 114 22 59.0 3
LAKE HAVASU
04015 ARIZONA

110191

11EPALES 2111202
0027 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/21	11	15 0000	10.1	10.6	50	796	8.50	136	0.030	0.600	0.210	0.007
	11	15 0005	10.3	10.6		800	8.50	136	0.020	0.400	0.200	0.005
	11	15 0015	10.1	11.0		800	8.50	136	0.020	0.500	0.200	0.013
	11	15 0023	10.1	10.8		796	8.50	137	0.020	0.500	0.200	0.015
75/06/13	10	20 0000	20.7	7.8		1033	8.25	135	0.080	0.600	0.180	0.018
75/11/19	13	20 0000	12.2	9.6	66	757	8.25	134	0.020	0.200	0.150	0.010
	13	20 0005	12.2	9.8		763	8.25	134	0.020	0.200	0.160	0.008
	13	20 0015	12.1	8.2		729	8.25	137	0.020	0.200K	0.160	0.005
	13	20 0024	11.9	10.0		765	8.25	144	0.020K	0.600	0.420	0.002

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/21	11	15 0000	0.016	5.4	
	11	15 0005	0.017		
	11	15 0015	0.015		
	11	15 0023	0.017		
75/06/13	10	20 0000	0.019		
75/11/19	13	20 0000	0.019	2.1	
	13	20 0005	0.019		
	13	20 0015	0.019		
	13	20 0024	0.014		

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/11/22
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040310
34 37 40.0 114 26 25.0 3
LAKE HAVASU
04015 ARIZONA

110191

1IEPALES 2111202
0027 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	10 20	0000	10.2	10.8	60	800	8.55	137	0.030	0.600	0.210	0.015
	10 20	0005	10.3	11.2		800	8.55	135	0.020	0.500	0.220	0.017
	10 20	0015	10.3	10.8		800	8.55	135	0.020	0.400	0.210	0.015
	10 20	0023	10.3	9.0		800	8.55	131	0.020K	0.400	0.200	0.009
75/06/13	10 00	0000	18.6	8.2		978	8.30	134	0.100	0.700	0.220	0.017
75/11/20	09 30	0000	12.2	9.6	48	765	8.25	125	0.020K	0.200K	0.170	0.002K
	09 30	0005	12.2	9.4		795	8.25	123	0.020K	0.200K	0.170	0.002K
	09 30	0015	12.1	9.0		759	8.25	124	0.020K	0.200	0.170	0.002K
	09 30	0020	12.1	9.4		774	8.25	126	0.020K	0.200K	0.170	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	10 20	0000	0.020	6.4	
	10 20	0005	0.023		
	10 20	0015	0.029		
	10 20	0023	0.041		
75/06/13	10 00	0000	0.022		
75/11/20	09 30	0000	0.016	1.7	
	09 30	0005	0.019		
	09 30	0015	0.018		
	09 30	0020	0.019		

K VALUE KNOWN TO BE LESS THAN INDICATED

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STORET RETRIEVAL DATE 76/11/26
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

040311
34 42 55.0 114 28 58.0 3
LAKE HAVASU
04015 ARIZONA

110141

11EPALES 2111202
0009 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/02/27	09 40	0000	9.7	10.6	72	780	8.40	138	0.060	0.700	0.220	0.021
	09 40	0005	9.7	11.2		780	8.40	137	0.020K	0.500	0.220	0.020
75/06/13	09 45	0000	17.4	7.2		962	8.20	134	0.090	0.500	0.220	0.030K
75/11/20	09 10	0000	12.5	10.2	96	771	8.25	127	0.020	0.200	0.170	0.002
	09 10	0005	12.5	9.8		787	8.25	127	0.020	0.200K	0.170	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/02/27	09 40	0000	0.021	6.4	
	09 40	0005	0.024		
75/06/13	09 45	0000	0.021		
75/11/20	09 10	0000	0.022	3.1	
	09 10	0005	0.016		

K VALUE KNOWN TO BE LESS THAN INDICATED

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403A1
34 17 40.0 114 08 20.0 4
COLORADO RIVER
04 7.5 GENE WASH
O/HAVASU LAKE 110191
BNK BELO PARKER DAM POWERHOUSE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/12/07	16 25		0.160	0.900	0.045	0.005	0.020
75/02/15	16 00		0.125	0.600	0.032	0.008K	0.010
75/03/15	15 20		0.116	1.000	0.032	0.008K	0.020
75/04/12	15 35		0.180	1.000	0.042		
75/04/25	16 00		0.175	0.700	0.045	0.005K	0.010K
75/05/10	16 30		0.170	0.250	0.020	0.005K	0.010K
75/05/24	16 00		0.135	0.500	0.035	0.005K	0.090
75/06/14	16 00		0.130	0.250	0.040	0.005	0.010
75/07/05	15 45		0.165	2.100	0.060	0.015	0.015
75/08/23	16 15		0.070	0.800	0.040	0.005	0.020
75/09/13	16 00		0.080	0.900	0.015	0.002	0.040
75/10/18	15 00		0.085	0.900	0.020	0.005K	0.030
75/11/15	15 45		0.110	0.800	0.025	0.005K	0.020

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403A2
34 42 55.0 114 29 00.0 4
COLORADO RIVER
04 7.5 TOPOCK
T/HAVASU LAKE 110191
RED ROCK BRDG AT TOPOCK
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/12/07	11	00	0.184	0.900	0.020	0.005	0.010
75/02/15	10	40	0.192	0.200	0.016	0.006	0.015
75/03/15	11	00	0.204	0.900	0.032	0.008K	0.020
75/04/11	11	00	0.200	0.900	0.035	0.005	0.010
75/04/26	11	00	0.210	0.900	0.045	0.005K	0.010K
75/05/10	11	10	0.220	0.400	0.025	0.005	0.010
75/05/24	11	05	0.190	0.200	0.020	0.005K	0.090
75/06/14	11	00	0.200	0.250	0.025	0.005	0.010
75/07/05	11	00	0.165	1.950	0.035	0.010	0.190
75/08/23	11	00	0.125	0.350	0.020	0.020	0.030
75/09/13	11	00	0.240	0.300	0.010	0.002	0.030
75/10/18	11	30	0.170	0.600	0.015	0.005K	0.030
75/11/15	11	00	0.155	0.500	0.015	0.005K	0.010

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403B1
34 18 13.0 114 09 25.0 4
GENE WASH
04 7.5 GENE WASH
T/HAVASU LAKE 110191
SEC RD BRDG 3.3 MI NW OF PARKER DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/12/07	15	25	0.160	0.900	0.015	0.005K	0.010K
75/02/15	14	45	0.064	0.100K	0.008	0.016	0.016
75/03/15	14	30	0.056	1.300	0.024	0.004K	0.020
75/04/12	15	00	0.030	1.000	0.075	0.005K	0.010
75/04/25	15	00	0.030	0.050	0.015	0.005K	0.010K
75/05/10	14	30	0.030	0.400	0.010	0.005K	0.050K
75/05/24	15	00	0.025	0.900	0.030	0.005K	0.090
75/06/14	15	00	0.035	0.350	0.015	0.005K	0.010
75/07/05	15	00	0.020		0.012		
75/08/23	15	15	0.020	0.050	0.015	0.005	0.010K
75/09/13	15	15	0.045	0.600	0.002	0.005K	0.010
75/10/18	14	45	0.030	0.700	0.015	0.005K	0.010K
75/11/15	15	00	0.060	0.300	0.010	0.005K	0.010K

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403C1
34 18 58.0 114 09 23.0 4
COLORADO RIV AQUEDUCT
04 7.5 GENE ASH
O/HAVASU LAKE 110191
BNK AT WHITSET INTAKE 1.5 M NW PARKER DM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/12/07	15	45	0.176	0.400	0.010	0.005K	0.010K
75/02/15	15	10	0.120	0.100K	0.008K	0.008K	0.010K
75/03/15	15	00	0.128	1.800	0.032	0.008K	0.040
75/04/12	15	30	0.185	0.550	0.075	0.005K	0.020
75/04/25	15	15	0.180	0.600	0.025	0.005K	0.010K
75/05/10	15	06	0.160	0.100	0.015	0.005	0.080
75/05/24	15	30	0.135	1.050	0.060	0.005K	0.100
75/06/14	15	30	0.125	0.250	0.020	0.005K	0.010
75/07/05	15	15	0.130	1.100	0.025	0.005	0.010K
75/08/23	15	30	0.015	0.400	0.015	0.005K	0.010
75/09/13	15	30	0.010	0.800	0.055	0.002	0.005
75/10/18	15	30	0.090	1.200	0.025	0.005K	0.020
75/11/15	15	00	0.110	0.650	0.015	0.005K	0.010K

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403E1
34 15 25.0 114 06 30.0 4
BILL WILLIAMS RIVER
04 YUMA CO GEN MAP
T/HAVASU LAKE 110191
SEC RD BRDG 29 MI NE OF PARKER
11EPALES 211204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/12/07	14 20		0.790	0.600	0.010	0.025	0.030
75/02/15	14 00		0.528	0.300	0.016	0.016	0.020
75/03/15	13 45		0.504	2.000	0.028	0.008	0.050
75/04/12	14 15		0.220	0.450	0.035	0.005K	0.020
75/04/25	14 30		0.135	0.850	0.075	0.010	0.010

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403AA AS0403AA P000200
34 43 00.0 114 29 30.0 4
CATFISH TRAILER PARK
04 7.5 TOPOCK
COLORADO RIVER 110141
UNNAMED CREEK
ILLEGALS 214120
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/06/03	09 30		26.000	2.100	0.060	8.900	9.530	0.015	0.015
75/06/16	08 00		40.000	0.500	0.081	13.500	13.500	0.015	0.015
75/07/09	08 00		30.000	1.200	0.025K	10.500	10.500	0.010	0.010
75/07/30	08 00		26.000	2.100	0.075	3.400	9.000	0.015	0.015
75/08/04	10 00		28.000	2.500	0.120	9.000	9.300	0.015	0.015
75/08/25	11 30		28.000	1.800	0.025	7.000	7.550	0.010	0.010
75/09/03	08 00		45.000	3.200	0.064	10.500	10.500	0.010	0.010

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

0403AB TF0403AB P006000
34 50 15.0 114 36 15.0 4
NEEDLES
06 15 NEEDLES
T/LAKE HAVASU 110191
COLORADO RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/07/23	11 00		10.000	1.700	0.345	3.600	3.900	1.000	1.000
75/08/06	10 00		8.300	2.750	0.180	4.200	4.200	1.000	1.000
75/08/20	11 00		8.800	3.300	0.150	4.600	4.900	1.000	1.000
75/09/03	12 30		11.000	5.500	0.610	4.000	4.100	1.000	1.000
75/09/17	10 00		9.200	3.200	0.270	4.200	4.600	0.900	1.000
75/10/08	09 00		10.500	4.500	0.350	5.800	5.900	0.800	0.900
75/10/15	10 00		11.500	5.600	0.125	6.100	6.400	0.600	0.700
75/10/29	12 00		13.000	5.200	0.525	6.950	7.300	0.600	1.300
75/11/19	13 00		8.400	13.000	4.000	8.300	9.500	0.500	0.500
75/12/10	11 00		7.800	6.000	0.140	7.750	9.900	0.450	0.450
75/12/24	09 00		6.700	8.900	2.500	12.000	15.000	0.450	0.450

STORET RETRIEVAL DATE 76/11/30
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

040321 AS040321 M000300
34 26 00.0 114 22 00.0 4
CATTAIL COVE STATE P
04 15 WHIPPLE MTS.
0/LAKE HAVASU 110141
LAKE HAVASU
11EPALES 21AZ04
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/05/03	12 00								
CP(T)-			0.100	54.000	45.000	3.150	6.900		
75/05/03	16 30								
75/06/04	10 00								
CP(T)-			0.150	57.500	31.000	2.400	5.600		
75/06/04	16 00								
75/07/05	11 00								
CP(T)-			0.025	48.000	32.000	2.800	3.800		
75/07/05	16 00								
75/08/08	12 00								
CP(T)-			0.600	4.700	0.100	1.300	1.400		
75/08/08	16 30								
75/09/03	11 30								
CP(T)-			0.100	46.000	41.000	3.100	3.700		
75/09/03	17 00								
75/10/09	16 00		0.100	38.000	25.000	3.800	3.800		
75/12/04	14 00		0.150	52.000	39.000	5.000	7.800		
76/01/11	09 00								
CP(T)-			12.600	2.400		5.600	7.700		
76/01/11	14 00								
76/02/08	10 30								
CP(T)-			0.075	11.000	0.065	5.300	11.000		
76/02/08	14 30								
76/03/17	15 30		0.050	62.000	40.500	4.000	8.600		

APPENDIX E

PARAMETRIC RANKINGS OF LAKES
SAMPLED BY NES IN 1975

STATE OF ARIZONA

Mean or median values for six of the key parameters evaluated in establishing the trophic conditions of Arizona lakes sampled are presented to allow direct comparison of the ranking, by parameter, of each lake relative to the others. Median total phosphorus, median inorganic nitrogen and median dissolved orthophosphorus levels are expressed in mg/l. Chlorophyll a values are expressed in µg/l. To maintain consistent rank order with the preceding parameters, the mean Secchi disc depth, in inches, is subtracted from 500. Similarly, minimum dissolved oxygen values are subtracted from 15 to create table entries.

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
0401	BIG LAKE	0.032	0.090	386.000	2.900	9.000	0.007
0402	FOOLS HOLLOW	0.059	0.090	466.600	10.683	14.800	0.014
0403	LAKE HAVASU	0.015	0.170	420.231	3.948	10.800	0.005
0404	LUNA LAKE	0.182	0.050	396.250	3.400	12.200	0.131
0405	LYMAN LAKE	0.099	0.060	484.667	2.633	9.000	0.056
0406	LAKE MOHAVE	0.017	0.240	369.667	4.404	8.600	0.010
0407	LAKE PLEASANT	0.027	0.040	449.154	9.808	14.900	0.004
0408	LAKE POWELL	0.009	0.400	239.000	1.333	12.200	0.010
0409	RAINBOW LAKE	0.046	0.045	440.750	16.367	12.000	0.009
0410	ROOSEVELT LAKE	0.020	0.040	429.917	4.073	14.000	0.008
0411	SAN CARLOS RESERVOIR	0.056	0.060	474.500	14.750	14.600	0.009
3201	LAKE MEAD	0.020	0.505	453.600	1.150	8.000	0.007

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO
0401	BIG LAKE	45 (5)	41 (4)	82 (9)	73 (8)	77 (8)	73 (8)
0402	FOOLS HOLLOW	18 (2)	41 (4)	18 (2)	18 (2)	9 (1)	18 (2)
0403	LAKE HAVASU	91 (10)	27 (3)	64 (7)	55 (6)	64 (7)	91 (10)
0404	LUNA LAKE	0 (0)	73 (8)	73 (8)	64 (7)	41 (4)	0 (0)
0405	LYMAN LAKE	9 (1)	64 (7)	0 (0)	82 (9)	77 (8)	9 (1)
0406	LAKE MOHAVE	82 (9)	18 (2)	91 (10)	36 (4)	91 (10)	32 (3)
0407	LAKE PLEASANT	55 (6)	95 (10)	36 (4)	27 (3)	0 (0)	100 (11)
0408	LAKE POWELL	100 (11)	9 (1)	100 (11)	91 (10)	41 (4)	32 (3)
0409	RAINBOW LAKE	36 (4)	82 (9)	45 (5)	0 (0)	55 (6)	45 (5)
0410	ROOSEVELT LAKE	68 (7)	95 (10)	55 (6)	45 (5)	27 (3)	64 (7)
0411	SAN CARLOS RESERVOIR	27 (3)	55 (6)	9 (1)	9 (1)	18 (2)	55 (6)
3201	LAKE MEAD	68 (7)	0 (0)	27 (3)	100 (11)	100 (11)	82 (9)